

REMARKS/ARGUMENTS

In response to the Office Action mailed from the United States Patent and Trademark Office on May 26, 2009, Applicant responds to the issues raised in the Office Action in the order presented in the Office Action. Claims 1, 3, 5-47 and 49-58 are pending. Claims 11-46 and 53-58 have been withdrawn from consideration. Claims 1, 3, 5-10, 47 and 49-52 are rejected. Accordingly, Applicant provides the following:

Claim Objections

Claims 49-51 were objected to because the claims each depend from cancelled claim 48. Claims 49-51 have been amended to appropriately depend from independent claim 47. Accordingly, Applicant respectfully requests that the objection to claims 49-51 be withdrawn at this time.

Rejections under 35 USC § 112:

Claim 50 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the pending Action indicated that it was unclear how “said seat support system comprises dual, independent static seats positioned on opposing sides of said valve closure,” since claim 47 recites “a live loaded seat.” Applicant has amended claim 50 to recite “wherein said seat support system comprises at least one independent static lower seat positioned on an opposing side of said valve closure from the at least one live loaded upper seat.” Accordingly, Applicant respectfully requests that the § 112, second paragraph, rejection be withdrawn at this time.

Rejections under 35 U.S.C. § 103(a):

Claims 1, 3, 5-7, 9, 10, 47 and 51 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Payne et al. (U.S. 2,403,608) in view of Richards (U.S.4,335,733). Applicant respectfully submits that the references cited in the Office Action, either alone or in combination with each other, do not teach or suggest all the claim limitations of the claim set provided herein. Likewise, the references fail to clearly and particularly suggest the allegedly obvious combination advanced by the Examiner. M.P.E.P. § 2141.

The present application is drawn to a coke drum deheading system comprising a seat support system structured to support a valve closure, wherein the seat support system comprises at least one live loaded upper seat, capable of maintaining continuous metal to metal contact between the valve closure and the at least one live loaded upper seat. The contact effectively allows shearing of accumulated coke and deheading of the coke drum upon actuation of the valve closure. As per the pending Action, Payne is silent as to the valve having the claimed configuration. Accordingly the § 103 rejection over the claimed valve configuration relies on the disclosure of a valve in Richards.

Richards' fails to teach a live loaded upper seat, wherein the live loaded upper seat structured to move axially while a valve closure is actuated between the open and the closed position, capable of maintaining continuous metal to metal contact between the valve closure and the at least one live loaded upper seat, effectively shearing accumulated coke and deheading a coke drum upon actuation. Rather, Richards discloses a valve for preventing the flow of abrasive fluids into the valve body from the process line. In particular, Richards discloses a valve closure comprising a lower cylindrical body member 24, having an extension 37 at its upper end, which is mounted to a so-called floating wear plate 38. See, FIGS. 6 and 9 of Richards. The wear plate 38 has an opening 39 aligned with the outlet chamber 28. The wear plate 38 "floats" in the sense that it is free to move axially in the extension 37, but otherwise is stationary.

Richards' concept of "float" is distinct from the claimed concept of "live loaded." Richards "floating" wear plate 38 is held in a rigid axial position by pressurized fluid, while the "live loaded" seat of the present application is allowed to move axially while the valve is being opened and closed in order to continuously maintain the metal to metal contact seal between the valve closure and the at least one live loaded upper seat.

Richards' "floating" wear plate 38 utilizes a groove 41 formed in the "upper end of the cylindrical body member 24 to receive a loaded ring 42 that engages the lower side of the floating wear plate 38. See, FIGS. 6 and 9 of Richards. The passageway 43 in the member 24 communicates with the bottom of the groove 41 as is best shown in FIG.9. The loading ring 42 is actuated by fluid under pressure supplied to the passageway 43 through a conduit 43a." Emphasis added, Richards, column 4, line 50 to column 5, line 15.

Accordingly, Richards discloses a valve with a lower seat that may be actuated and held in a rigid axial position by pressurized fluids against the lower portion of a gate, not a live loaded seat capable of maintaining continuous metal to metal contact while a valve opens and closes. If pressurized, the fluid channel 43 is filled in and floating wear plate 38 is pressed against the valve closure. Under pressure the floating plate 38 is not capable of moving in an axial plane as a valve closure is opened. Accordingly, Richards' floating plate 38 cannot move axially while pressurized to accommodate variance in the surface of the valve closure.

By way of contradistinction, to accommodate surface variance on the valve closure the "live loaded" seat of the present application is structured to allow dynamic, axial movement of the seat while the valve closure is being moved from closed to open positions. As noted in the specification, the presently claimed valve is utilized in connection with a delayed coking process where molten hydrocarbon resid is fed into a coke drum, thermally cracked into light products and a solid residue referred to as coke. The solid, coal like, petroleum coke is then cut from the interior of the coke drum using high pressure, and allowed to fall through an open valve at the bottom of the coke drum. The molten resid is heated to thermal cracking temperatures, which range upwards of 1,000° F before being injected into the coke drum. The incoming product is injected into the drum and collides with the opposite side wall resulting in stark heat distribution variances between the vessel, lower spool and de-header valve. As the drum is being filled, a large amount of liquid runs down the sides of the drum into a boiling turbulent pool at the bottom. A de-header valve must be designed to retain tons of molten coke and withstand mechanical stresses induced by the massive heat distribution variances (e.g., thermal ratcheting). Valve closure deformation is a common mechanical stress associated with thermal ratcheting. As a valve closure experiences massive heat distribution variances, it warps. Accordingly, the upper surface of a valve plate in a coking operation is uneven and the valve closure, particularly the upper seat of the valve closure must be capable of moving axially continually during opening and closing of the valve to maintain a continuous metal to metal contact seal between the valve closure and the at least one live loaded upper seat. Applying continuous hydraulic pressure, as disclosed by Richards, fails to teach a seat capable of flexing with the inconsistencies associated with a warped valve closure. Accordingly, Richards fails to disclose a valve capable of operating at the bottom of a coke drum.

Claims 1, 3, 5-8, 47 and 49-52 were rejected under 35 U.S.C. 103(a) as being unpatentable over Payne et al. in view of Fortune (U.S. 3,367,625). Claims 9 and 10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Payne et al. in view of Fortune, as applied to claim 1 above, and further in view of Richards (U.S. 4,335,733). Applicant respectfully submits that the references cited in the Office Action, either alone or in combination with each other, do not teach or suggest all the claim limitations of the claim set provided herein. Likewise, the references fail to clearly and particularly suggest the allegedly obvious combination advanced by the Examiner. M.P.E.P. § 2141. As noted above, the pending Action, Payne is silent as to the valve having the claimed valve configuration. Accordingly the § 103 rejection over the claimed valve configuration relies on the disclosure of a valve in Fortune.


Similar to Richards, Fortune fails to teach a live loaded upper seat, wherein the live loaded upper seat structured to move axially while a valve closure is actuated between the open and the closed position, capable of maintaining continuous metal to metal contact between the valve closure and the at least one live loaded upper seat, effectively shearing accumulated coke and deheading a coke drum upon actuation. Rather, fortune discloses a surface 26 that abuts against the surface 27 of the seating and backing plate 24, when the annular reservoir 22 is pressurized. Fortune, Col. 4, lns 61-69; see FIG. 3. As discussed above in relation to Richards, the valve disclosed by Fortune is limited in operation by the hydraulic actuation of a valve seat. If pressurized, the annular reservoir 22 is filled and the floating seat is pressed against the valve closure. Under pressure the seat is not capable of moving in an axial plane as a valve closure is opened to accommodate variance in the surface of the valve closure. By way of contradistinction, to accommodate surface variance on the valve closure the “live loaded” seat of the present application is structured to allow dynamic axially movement of the seat while the valve closure is being moved from closes to open positions. Accordingly, Payne, Fortune and Richards taken alone or in combination fails to disclose a valve capable of operating at the bottom of a coke drum. For at least this reason, Applicant respectfully submits that the prior art references do not, independently or in combination, explicitly or impliedly teach every aspect of the invention as claimed in the independent base claims. In addition, the dependent claims place further limitations on otherwise allowable subject matter. Accordingly, Applicant respectfully submits that the cited art does not teach every aspect of the claims as provided herein and therefore does not render the claims obvious as provided herein.

CONCLUSION

Applicant submits that the amendments made herein do not add new matter and that the claims are now in condition for allowance. Accordingly, Applicant requests favorable reconsideration. If the Examiner has any questions or concerns regarding this communication, the Examiner is invited to call the undersigned.

DATED this 26 day of August, 2009.

Respectfully submitted,


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